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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/829,666	04/22/2004	J. Gary Eden	1201.68291	7738
24978	7590	11/09/2006		EXAMINER
GREER, BURNS & CRAIN				DONG, DALEI
300 S WACKER DR				
25TH FLOOR			ART UNIT	PAPER NUMBER
CHICAGO, IL 60606				2879

DATE MAILED: 11/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/829,666	EDEN ET AL.
	Examiner	Art Unit
	Dalei Dong	2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### **Status**

1) Responsive to communication(s) filed on 18 October 2006.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### **Disposition of Claims**

4) Claim(s) 1-25 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-13 and 15-25 is/are rejected.  
 7) Claim(s) 14 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### **Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 22 April 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### **Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### **Attachment(s)**

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_.

**DETAILED ACTION**

1. The Amendment filed on October 18, 2006, has been entered and acknowledged by the Examiner.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 6, 10, 11 and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,456,007 to Ryu.

Regarding to claim 1, Ryu discloses in Figures 4-6, a phased-locked microdischarge array, comprising: a substrate (54, see column 5, lines 56-59); a plurality of microdischarge cavities (groove 54b) in the substrate (54) containing discharge medium (see column 1, lines 58-61), the microdischarge cavities (54b) being sized and arranged such that at least some of the microdischarge cavities (54b) are within the coherence length (the Examiner interprets that the cavities are arranged in rows and columns and thus within the coherence length) of, at least one emission line produced by the discharge medium contained in the microdischarge cavities (54b); at least one pair of electrodes (electrodes X and Y) for exciting the plurality of microdischarge cavities (54b) for excitation of the discharge medium by application of electrical power.

Regarding to claim 2, Ryu discloses in Figures 4-6, at least one pair of electrodes (electrode of X and Y) are isolated from each other and the discharge medium (by dielectric layer 52) such that AC (see column 1, lines 21-22) applied to the pair of electrodes stimulates discharge from the discharge medium.

Regarding to claim 3, Ryu discloses in Figures 4-6, a dielectric layer (52) isolates said at least one pair of electrodes (electrode of X and Y) from each other and the discharge medium.

Regarding to claim 4, Ryu discloses in Figures 4-6, a protective layer (53) between the dielectric layer (52) and the plurality of microdischarge cavities (54b).

Regarding to claim 6, Ryu discloses in Figures 4-6, the substrate (54) comprises one of the at least one pair of electrodes (55) and the microdischarge cavities (54b) are formed as a hollow cathodes that penetrate the substrate, the array further comprising: a transparent electrode (electrode of X and Y) forming the other of at least one pair of electrodes; and a dielectric layer (52) to isolate the transparent electrode (electrode of X and Y) from the substrate (54).

Regarding to claim 10, Ryu discloses in Figures 4-6, the discharge medium (see column 1, lines 59-61) is selected from the group consisting of the atomic rare gases, N2, and the rare gas-halide molecules.

Regarding to claim 11, Ryu discloses in Figures 4-6, the discharge medium comprises neon gas (see column 1, lines 59-61).

Regarding to claim 16, Ryu discloses in Figures 4-6, at least one pair of electrodes (electrodes of X and Y) are separated from the discharge medium (54b) to excite the discharge medium (30) when AC (see column 1, lines 21-22) is applied to said electrodes.

Regarding to claim 17, Ryu discloses in Figures 4-6, the at least one pair of electrodes (electrode 55) is arranged to have an electrode directly contact the discharge medium (54b) to excite said discharge medium when AC (see column 1, lines 21-22) power is applied to said electrodes. Furthermore, the Applicant claims the electrodes can be in directly contact or separated from the discharge medium, thus the Examiner interprets that the placement of the electrode relative to the discharge medium is not critical to the present invention.

Regarding to claim 18, Ryu discloses in Figures 4-6, means for sealing (front substrate along with the sealing layer) the discharge medium (30) in the plurality of microdischarge cavities (54b).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
5. Claims 5, 7, 8 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,456,007 to Ryu in view of U.S. Patent No. 4,843,281 to Mendelsohn.

Regarding to claim 5, Ryu discloses in Figures 4-6, a phased-locked microdischarge array, comprising: a substrate (54, see column 5, lines 56-59); a plurality of microdischarge cavities (groove 54b) in the substrate (54) containing discharge medium (see column 1, lines 58-61), the microdischarge cavities (54b) being sized and arranged such that at least some of the microdischarge cavities (54b) are within the coherence length (the Examiner interprets that the cavities are arranged in rows and columns and thus within the coherence length) of, at least one emission line produced by the discharge medium contained in the microdischarge cavities (54b); at least one pair of electrodes (electrodes X and Y) for exciting the plurality of microdischarge cavities (54b) for excitation of the discharge medium by application of electrical power.

However, Ryu does not specifically disclose the microdischarge cavities array are arranged to approximate a Fresnel pattern, and groups of microdischarge cavities comprise approximate rings in the Fresnel pattern.

Mendelsohn teaches the microdischarge cavities are arranged in a square shape (shown in Figure 1) and each microdischarge cavity can be individually addressed and thus it can produce an image in the Fresnel pattern or approximately in the rings in Fresnel pattern.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have arrange the microdischarge cavities of Ryu in different arrangement of Mendelsohn in accordance to the desired specification and specific utility.

Regarding to claim 7, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have arrange the plurality of microdischarge cavities of Mendelsohn in approximately a Fresnel pattern.

Regarding to claim 8, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have arrange the plurality of microdischarge cavities of Mendelsohn in approximately a Fresnel pattern.

Regarding to claim 20, Ryu discloses in Figures 4-6, a phased-locked microdischarge array, comprising: a substrate (54, see column 5, lines 56-59); a plurality of microdischarge cavities (groove 54b) in the substrate (54) containing discharge medium (see column 1, lines 58-61), the microdischarge cavities (54b) being sized and arranged such that at least some of the microdischarge cavities (54b) are within the

coherence length (the Examiner interprets that the cavities are arranged in rows and columns and thus within the coherence length) of, at least one emission line produced by the discharge medium contained in the microdischarge cavities (54b); at least one pair of electrodes (electrodes X and Y) for exciting the plurality of microdischarge cavities (54b) for excitation of the discharge medium by application of electrical power.

However, Ryu does not specifically disclose the microdischarge cavities are arranged in a Fresnel pattern, and the substrate being optically transparent to an emission wavelength of the microdischarge array.

Mendelsohn teaches the microdischarge cavities are arranged in a square shape (shown in Figure 1) and each microdischarge cavity can be individually addressed and thus it can produce an image in the Fresnel pattern or approximately in the rings in Fresnel pattern. Furthermore, by making the spacers optical transparent it would have improve the luminescence of the device.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have arranged the microdischarge cavities of Ryu in a Fresnel pattern of Mendelsohn in order to improve the luminescence of the device.

6. Claims 9, 21, 22, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,456,007 to Ryu in view of U.S. Patent No. 6,043,604 to Horiuchi.

Regarding to claim 9, Ryu discloses in Figures 4-6, a phased-locked microdischarge array, comprising: a substrate (54, see column 5, lines 56-59); a plurality of microdischarge cavities (groove 54b) in the substrate (54) containing discharge

medium (see column 1, lines 58-61), the microdischarge cavities (54b) being sized and arranged such that at least some of the microdischarge cavities (54b) are within the coherence length (the Examiner interprets that the cavities are arranged in rows and columns and thus within the coherence length) of, at least one emission line produced by the discharge medium contained in the microdischarge cavities (54b); at least one pair of electrodes (electrodes X and Y) for exciting the plurality of microdischarge cavities (54b) for excitation of the discharge medium by application of electrical power.

The limitation of the plurality of microdischarge cavities etched in to the photosensitive glass is a method of manufacturing the device. Please note that the claimed method steps are product by process limitations. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of product. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Furthermore, it is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an obvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113).

However, Ryu does not specifically disclose the substrate comprises photosensitive glass.

Horiuchi teaches in Figures 1-8, a microdischarge array, comprising: a substrate (spacers forming the microdischarge cavities) comprises photosensitive glass (see column 7, lines 1-26) for the purpose of providing a barrier ribs with less meandering, falling, peeling and breaking by improving the strength of the barrier ribs and their adhesion to the substrate.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilize photosensitive glass of Horiuchi for the microdischarge array of Ryu in order to provide a spacer with less meandering, falling, peeling and breaking by improving the strength of the barrier ribs and their adhesion to the substrate.

Regarding to claim 21, Ryu discloses in Figures 4-6, a phased-locked microdischarge array, comprising: a substrate (54, see column 5, lines 56-59); a plurality of microdischarge cavities (groove 54b) in the substrate (54) containing discharge medium (see column 1, lines 58-61), the microdischarge cavities (54b) being sized and arranged such that at least some of the microdischarge cavities (54b) are within the coherence length (the Examiner interprets that the cavities are arranged in rows and columns and thus within the coherence length) of, at least one emission line produced by the discharge medium contained in the microdischarge cavities (54b); at least one pair of electrodes (electrodes X and Y) for exciting the plurality of microdischarge cavities (54b) for excitation of the discharge medium by application of electrical power.

However, Ryu does not disclose the substrate or the spacer is a semiconductor substrate.

Horiuchi teaches in Figures 1-8, a microdischarge array, comprising: a substrate (spacers forming the microdischarge cavities) comprises semiconductor (see column 7, lines 1-26) for the purpose of providing a barrier ribs with less meandering, falling, peeling and breaking by improving the strength of the barrier ribs and their adhesion to the substrate.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilize semiconductor of Horiuchi for the microdischarge array of Ryu in order to provide a spacer with less meandering, falling, peeling and breaking by improving the strength of the barrier ribs and their adhesion to the substrate.

Regarding to claim 22, Ryu discloses in Figures 4-6, a protective layer (53) disposed between the plurality of microdischarge cavities (54b) and the dielectric layer (52).

Regarding to claim 24, Ryu discloses in Figures 4-6, all of the microdischarge cavities lie within one coherence length of at least one emission line produced by the discharge medium (30) from all other ones of the microdischarge cavities (54b).

Regarding to claim 25, Ryu discloses in Figures 4-6, a microdischarge array, comprising: a substrate (54); at least one pair of electrodes (electrode of X and Y); an insulation layer (52) to isolate the electrodes (electrode of X and Y) from the substrate (54); a dielectric layer (52) to isolate the at least one pair of electrodes (electrode of X and Y) from each other; a dielectric substrate (50 or 51); a plurality of microdischarge cavities (54b) containing discharge medium in the substrate (54) and being physically isolated from the at least one pair of electrodes (electrode of X and Y) by the dielectric layer (52); and a transparent layer (50) sealing the discharge medium the plurality of microdischarge cavities.

However, Ryu does not disclose the substrate or the spacer is a semiconductor substrate.

Horiuchi teaches in Figures 1-8, a microdischarge array, comprising: a substrate (spacers forming the microdischarge cavities) comprises semiconductor (see column 7, lines 1-26) for the purpose of providing a barrier ribs with less meandering, falling, peeling and breaking by improving the strength of the barrier ribs and their adhesion to the substrate.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilize semiconductor of Horiuchi for the microdischarge array of Ryu in order to provide a spacer with less meandering, falling, peeling and breaking by improving the strength of the barrier ribs and their adhesion to the substrate.

7. Claims 12, 13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,456,007 to Ryu in view of U.S. Patent No. 4,720,706 to Stine.

Regarding to claim 12, Ryu discloses in Figures 4-6, a phased-locked microdischarge array, comprising: a substrate (54); a plurality of microdischarge cavities (54b) in the substrate containing discharge medium (see column 1, lines 59-61), the microdischarge cavities (54b) being sized and arranged such that at least some of the microdischarge cavities (54b) are within the coherence length (the Examiner interprets that the cavities are arranged in rows and columns and thus within the coherence length) of, at least one emission line produced by the discharge medium contained in the microdischarge cavities (54b); at least one pair of electrodes (electrode of X and Y) for exciting the plurality of microdischarge cavities (54b) for excitation of the discharge medium by application of electrical power; and a controller (voltage source) for controlling delivery of electrical power to the at least one pair of electrodes (electrode of X and Y) to stimulate the microdischarge array.

However, Ryu does not disclose the array being optically coupled to an optical transmission medium to launch optical power into the optical transmission medium.

Stine teaches in Figures 1 and 2, an optical communication system, comprising: a microdischarge array (see column 1, lines 24-29) being optically coupled to an optical transmission medium (see column 5, lines 41-59) for the purpose of providing remote display of scenes or spot-transmissions; or converting electrical analogs of the chromatic constituents.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the microdischarge array of Ryu for the optical communication system of Stine in order to provide remote display of scenes or spot-transmissions; or convert electrical analogs of the chromatic constituents.

Regarding to claim 13, Stine teaches in Figures 1 and 2, the optical transmission medium comprises an optical fiber (see column 5, lines 41-59) and the motivation to combine is the same as above.

Regarding to claim 19, Stine teaches in Figures 1 and 2, a grating optically coupled to the microdischarge cavities (see column 12, lines 34-38) and the motivation to combine is the same as above.

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,456,007 to Ryu in view of U.S. Patent No. 5,132,811 to Iwaki.

Regarding to claim 15, Ryu discloses in Figures 4-6, a phased-locked microdischarge array, comprising: a substrate (54); a plurality of microdischarge cavities (54b) in the substrate containing discharge medium (see column 1, lines 59-61), the microdischarge cavities (54b) being sized and arranged such that at least some of the microdischarge cavities (54b) are within the coherence length (the Examiner interprets that the cavities are arranged in rows and columns and thus within the coherence length) of, at least one emission line produced by the discharge medium contained in the

microdischarge cavities (54b); at least one pair of electrodes (electrode of X and Y) for exciting the plurality of microdischarge cavities (54b) for excitation of the discharge medium by application of electrical power; and a controller (voltage source) for controlling delivery of electrical power to the at least one pair of electrodes (electrode of X and Y) to stimulate the microdischarge array.

However, Ryu does not disclose a memory device, comprising a memory medium disposed at a focal length of the microdischarge array.

Iwaki teaches in Figures 1-3, a memory device, comprising: a memory medium (see column 4, lines 1-23) disposed at a focal length of the microdischarge array (see column 24, lines 39-53) for the purpose of constituting a compact optical correlator and entering the code image.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the microdischarge array of Ryu for the memory device of Iwaki in order to constitute a compact optical correlator and enter the code image.

9. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,456,007 to Ryu in view of U.S. Patent No. 6,043,604 to Horiuchi in further view of U.S. Patent No. 4,720,706 to Stine.

Regarding to claim 23, Ryu in view of Horiuchi discloses, a microdischarge array, comprising: a semiconductor substrate; at least one pair of electrodes; an insulation layer to isolate the electrodes from the substrate; a dielectric layer to isolate the at least one pair

of electrodes from each other; a dielectric substrate; a plurality of microdischarge cavities containing discharge medium in the substrate and arranged to produce a phase-locked response when excited, the plurality of microdischarges cavities being physically isolated from the at least one pair of electrodes by the dielectric layer; and a transparent layer sealing the discharge medium the plurality of microdischarge cavities.

However, Ryu and Horiuchi does not disclose a grating optically coupled to the plurality of microdischarge cavities.

Stine teaches in Figures 1 and 2, a grating optically coupled to the microdischarge cavities (see column 12, lines 34-38) for the purpose of providing remote display of scenes or spot-transmissions; or converting electrical analogs of the chromatic constituents.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the grating of Stine for the microdischarge array of Ryu in order to provide remote display of scenes or spot-transmissions; or convert electrical analogs of the chromatic constituents.

#### ***Allowable Subject Matter***

10. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding to claim 14, prior art of record taken alone or in combination fails to teach or suggest a microdischarge device comprising: a flow system including an examination station disposed at focal length of the microdischarge array for passing living cells within the focal length of the microdischarge array; and a controller for controlling delivery of electrical power to said at least one pair of electrodes to stimulate said microdischarge array to direct optical power into the examination station.

***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following prior art are cited to further show the state of the art of composition of a microdischarge device.

U.S. Patent No. 4,956,577 to Parker.

U.S. Patent No. 5,984,747 to Bhagavatula.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (571)272-2370. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on (571)272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

D.D.  
October 30, 2006



Dalei Dong  
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